

| <b>Notice of Allowability</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|-------------------------------|------------------------|---------------------|--|
|                               | 10/735,045             | MAST ET AL.         |  |
|                               | Examiner               | Art Unit            |  |
|                               | Jaworski Francis J.    | 3768                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to RCE, IDS9/21/0,11/20/06.
2.  The allowed claim(s) is/are 1 - 21.
3.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All b)  Some\* c)  None of the:
    1.  Certified copies of the priority documents have been received.
    2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftsperson's Patent Drawing Review (PTO-948)
3.  Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 9/21/06,11/20/06
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_.
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other \_\_\_\_\_.



Francis J. Jaworski  
Primary Examiner

## **EXAMINER'S AMENDMENT**

Continuing case status has been updated by insertion into specification page 3 line 3 after "2002" -- and now abandoned --.

## **REASONS FOR ALLOWANCE**

The following is an examiner's statement of reasons for allowance:

Consideration of the two sheets of documents provided with the Information disclosure statement filed on September 21, 2006 was given as follows:

Pfeiler et al (US5042486) is directed to the use of an ultrasound acoustic or microwave antenna transponder system for locating a catheter tip in conjunction with a non-ionizing microwave or ultrasound imaging modality.

Seward et al (US6059731) is directed towards catheter-based omnidirectional ultrasound array imaging for diagnostic and therapeutic purposes.

Rittman, III et al (US6575969) is directed to imaging of thermal ablation progress using ultrasound or other modalities with temperature monitoring using a thermal probe proximal to the ablation tip. The terms conjugate are used in a context apart from this application in that the imaging system is conjugate or ancillary to the ablation system and complex pertains to anatomic structure associated with isothermal maps prepared during preplanning of the ablation.

The citation to the Pharmasonics assignee on the 9/21/06 IDS submission is believed to have been in error (since a 2004 PGPub could not have a 2001 publication

date) and so has been revised to - - US20010041880 - - and the patent which issued from that document is characterized immediately below and cited on an accompanying PTO-892.

Brisken et al (US6524271) is directed mainly to improved catheter-based ultrasound transducer design for energy deposition uniformity in association inter alia with ultrasound transducer diathermy however the real—time IVUS imaging to monitor treatment progress does not factor into a thermo regulatory or a thermal monitoring role.

Document WO97/29709 is directed to use of non-ionizing fields to orient two probes for conducting medical procedures with both probes.

Document WO99/33500 is directed to the practice of ultrasound vessel permeability enhancement for facilitating genetic transfection using a catheter based ultrasound treatment at frequencies, energy densities and duty cycles designed to minimize any harmful temperature rise.

Document WO01/43641 is directed to design adaptations for minimizing the acoustic or electromagnetic force field detected on the position sensor for example for a therapeutic energy deposition catheter.

Documents submitted with the September 01, 2006 IDS were considered to be directed to ultrasound imaging or to HIFU or ablation instruments and/or in conjunction with ultrasound targeting functions and therefore cumulative to the characterizations provided above, when considered in relation to the claimed invention.

None of the prior art alone or in combination with previously cited art teaches the obtaining of ultrasound image data or image frame data at first and second (later) times

or obtaining a sequence of ultrasound image frames having a progression over time, computing complex analytic signals from the ultrasound image data or frames or an average of such frames, computing a depth dependent delay or delay map from the conjugate of the complex analytic signals so as to generate an echo strain map from the delay slope and creating an image therefrom which displays a mapping of temperature rise or temperature changes in the anatomic tissue..

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

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Francis J. Jaworski  
Primary Examiner